Index to Volume III

January-December, 1931

Heating, Piping and Air Conditioning

Air Conditioning—General

Heat or Humidity, by Edgar S. Miller.
No. 1. January, 1931. p. 92.
(Open for Discussion); comments on "It's Not the Heat but the Humidity"; influence of wet bulb and dry bulb temperatures; more advisable to say "It's not the temperature but the heat."

The Factors in Air Conditioning for Human Comfort.
No. 2. February, 1931. p. 129.
Crowd poisoning theory; CO_2; ionization; temperature; circulation and humidity.

Effective Temperature—What It Means, by Edward F. Adolph.
No. 6. June, 1931. p. 483.
Physiological basis for effective temperatures; modes of heat loss from body; effective temperature lines; psychrometric chart; neutral atmospheres. 1 i.

Saving Money in Motor Operation, by Louis Mackler.
No. 8. August, 1931. p. 649.
Electrical distribution systems; nature of connected load; resistance to current flow; over- and under-voltages; effect on heating devices; effect on motors; results of unbalanced voltages.

Air Conditioning—A Discussion of Some of the Phenomena Involved, by Edgar S. Miller.
No. 9. September, 1931. p. 752.
The term "hygroscopic"; static electricity and moisture regain; pH concentration; importance of knowing cause of temperature and humidity conditions; an example; stuffy sensation in crowded rooms; discomfort in high humidities; comfort in various air environments; is electricity of paramount importance in air conditioning? 2 i.

How Sound Is Controlled, by Vern O. Knudsen.
No. 10. October, 1931. p. 815.
Air conditioning and acoustics intimately related; attention to ventilating noise; noise tests; insulation of solid-borne noise; how transmissibility of an elastic support depends on frequency; typical example of insulating a machine; noise originating in equipment room; noise through ducts; air currents; effect of humidity on acoustics; control of sound not guess-work. 6 i.

Comfort Zone in the Southwest.
No. 11. November, 1931. p. 903.
Upper limits of comfort zone in Texas.

The Influence of Atmospheric Conditions on Health and Growth, by C. P. Yaglou.
No. 11. November, 1931. p. 926.
(Part I of the report to the committee on growth and development, White House conference on child health and protection); seasonal variation in morbidity and mortality; environmental factors in relation to respiratory diseases; seasonal variation in infantile mortality from respiratory and intestinal diseases in birth registration area of continental United States; environmental factors and intestinal diseases; geographic distribution of seasonal diseases according to seasonal temperature; seasonal variation in infantile mortality from all causes, New York City; geographic distribution of seasonal excess in infantile mortality rate according to seasonal temperature in a group of 41 large cities; influence of humidity, variability, wind, etc., upon infant mortality; probable optimum climate; seasonal variation in growth; atmospheric pollution; carbon monoxide. 6 i.

The Influence of Atmospheric Conditions on Health and Growth, by C. P. Yaglou.
No. 12. December, 1931. p. 1006.
(Part II of the report to the committee on growth and development, White House conference on child health and protection); changes in composition and vitiation of air by respiratory and metabolic processes; physiological effects of temperature, humidity and air motion; measuring atmospheric conditions and their effects; optimum indoor conditions; effective temperature chart with comfort zones superimposed; natural ventilation; mechanical systems; school room ventilation—natural, mechanical and special; outdoor versus indoor life; bibliography. 2 i.

Air Conditioning in Industrial Processes, by Walter L. Fleisher.
No. 3. March, 1931. p. 196.
Unusual problems to meet in air conditioning for match manufacture; historical review; legislation; need of air conditioning; tipping machines; temperature and speed controlled; air conditions; amount of water evaporated; control; amount of water absorbed by air; air motion; cooling load; moisture in entering air; calculations for refrigeration required; fans and heaters. 8 i.

Insulation Decreases Load on Industrial Air Conditioning Plant by One-third, by Rush D. Touton.
No. 6. June, 1931. p. 453.
Central plant of Bayuk Cigars, Inc., Philadelphia, Pa.; amount corkboard used; insulation aids control; advantages of conditioning system; application of insulation; steam pipe prevents window condensation; processing rooms; insulating industrial plants; savings made. 7 i.

Office Building Rental Problem Simplified by Air Conditioning, by Ralph E. Phillips.
No. 2. February, 1931. p. 124.
Banks-Huntley office building, Los Angeles, Calif.; windows locked; acoustic treatment; air conditioning system in units; vacuum heating; mechanical exhaust systems; coolers for dehumidifiers on three levels; cooling tower; conditions maintained; intakes; fan capacities and pressures; velocities in ducts; indicating instruments; cost of installation and operation; advantages. 11 i.

Modern Heating and Air Conditioning Practices Applied to a Bank, by Samuel R. Lewis.
No. 4. April, 1931. p. 310.
Description of Ohio Bank building (Toledo); boilers suspended from structural steel; underfeed stokers; boiler protection scheme; control of centrifugal feed pumps; zoned vacuum system; conditioned air for deposit vaults; for banking spaces; window drafts prevented; chimney effect; carbon dioxide compressor; washers; motors; fans; size of air cooling plant; piping gas welded; heating and hot water systems; air inlets. 10 i.

Air Conditioning Used to Increase Prestige and Attract Patronage, by Louis L. Narowetz, Jr.
No. 4. April, 1931. p. 295.
Northern Trust Co. bank building (Chicago) air conditioned; four units used; diagram showing air distribution; air introduction; centrifugal refrigeration machine, pumps, and motors; temperature indicating system. 4 i.

45% Power Saving by Intermittent Control of Central Station Type Air Conditioning System, by Charles S. Leopold.
No. 12. December, 1931. p. 989.
How economy is obtained by intermittent operation; description of air conditioning system and its control in aquatone press room of Edward Stern & Co., Inc., Philadelphia; aquatone printing; paper stretch; operation of refrigeration control system and air conditioning control system; program clock times intermittent operation; charts show results obtained; power savings; conclusions. 11 i.

Instruments Necessary to Control Air Conditioning.
No. 5. May, 1931. p. 449.
(Some Reports on Research); interview with M. M. Davidson, manager, Northern Trust Co. building, Chicago; use of resistance thermometers for keeping manager informed of conditions maintained; charts of typical conditions inside and outside in summer and winter. 1 i.

The New Hotel Waldorf-Astoria—A Description of the Ventilating and Air Conditioning Systems, by the Staff of Clyde R. Place.
No. 5. May, 1931. p. 369. Also see p. 275, April, 1931.
Fans handle 1,000,000 c.f.m.; ducts; main kitchen; 12% of ventilating load conditioned; condensing water used in plumbing system; conditioning units; the ball room, removing heat from lights; plan of fan room. 5 i.

Heating and Air Conditioning the Cleveland Union Terminal, by J. W. Carrow.
No. 3. March, 1931. p. 219. Also see p. 99, February, 1931.
Ventilation; capacities of fans; air intakes; air changes; spray cools intake; duct work and expansion joints; motors; grilles; temperature regulation; dining, lunch room and barber shop air conditioned; air supply; cool air for concession display cases; general service refrigeration; centrifugal pumps; designers and constructors of building. 5 i.

Heating and Air Conditioning Must Be Carefully Considered in Design of Buildings, by Mortimer Freund.
No. 4. April, 1931. p. 288.
Designer must know practical limitations; cooperation of architects and engineers; conferences; hotel floor plan revised; pipes in ventilating ducts; structural engineer; superintendence; obstructing shafts; improper design a heavy penalty; ventilating riser diagram for apartment. 2 i.

University Building Provides for Air Conditioning Studies.
No. 6. June, 1931. p. 489.
(Some Reports on Research—interview with E. V. Lippe); Medical and Dental Research building of University of Illinois; air problems; air experimentation room; conditions maintained; joining ceramic pipe. 1 i.

Air Conditioning—Cleaning (Including Dust and Dust Collection)

Operation and Maintenance of Air Filters, by W. G. Frank.
No. 5. May, 1931. p. 378.
Factors influencing performance of air filter; types; typical maintenance chart; cleaning frequency; diagram for; resistance; use of gage; maintenance during construction period; cleaning viscous cells; servicing dry type; automatic filters; removal of sludge; proper maintenance pays. 4 i.

Cleaning Routine for Air Filters at Compressor Intake.
No. 8. August, 1931. p. 667.
Routine for cleaning 10-unit battery of filter cells installed at intake of 5,000 c.f.m. air compressor at Firestone Tire & Rubber Co. plant.

Lint Collector for a Laundry, by W. H. Pierce.
No. 5. May, 1931. *p.* 412.
Construction of a lint collector for a clothes dryer in a laundry; baffles; cleaning. 1 i.

New Approach to Air Pollution Problems.
No. 1. January, 1931. *p.* 94.
(Interviews of Interest); interview with R. D. MacLaurin; smoke laboratory in Cleveland; studies made; smoke abatement a research problem. 1 i.

Air Filters Aid Hay Fever Cases, by H. C. Murphy.
No. 1. January, 1931. *p.* 14.
Use of filters in hospitals quite general.

Hay Fever, by D. O. N. Lindberg.
No. 3. March, 1931. *p.* 225.
Discussion of "Hay Fever," p. 843, October, 1930, issue; pollen dust only a single source of allergic reaction; washed air for hospitals.

Effect of Dust.
No. 6. June, 1931. *p.* 490.
Review of article in *Journal of Allergy* by Bret Ratner; harmful effects of dust.

Air Conditioning—Cooling

Now Is the Time to Overhaul Air Cooling and Refrigerating Equipment, by R. C. Doremus.
No. 1. January, 1931. *p.* 1.
Necessity of overhauling; systematic schedule; the compressor; suction and discharge valves; safety head; checking clearances; piston rings; piston rod and packing; crosshead and guides; motor; reassembling compressor; oil, liquid and scale traps; condensers; receiver; direct expansion piping; brine piping; acidity of brine; water piping; pumps; refrigerant; insulation; instruments; fans; electrical equipment. 4 i.

Controlled Cooling Is Profitable, by Malcolm Tomlinson.
No. 2. February, 1931. *p.* 113.
Machines replace human labor to advantage; cooling by evaporation; candy industry needs controlled humidity; advantages of automatic control; example; savings. 5 i.

Avoiding Shock When Leaving Air Conditioned Spaces.
No. 6. June, 1931. *p.* 457.
Excerpt from talk of Eugene D. Milener before natural gas department of American Gas Association; reasons for maintaining a balance between inside and outside conditions.

Improved Compressor Operation a Road to Air Conditioning Economy, by John C. Reed and Edgar E. Ambrosius.
No. 9. September, 1931. *p.* 746.
Indicator cards and their use; clearance; packing; apparent volumetric efficiency; real volumetric efficiency; superheating effect; reduction of cylinder pressure below that in suction line; economical pipe sizes; speed of compressor; valves; jacket water; overall volumetric efficiency; compression ratio. 7 i.

Air Conditioning for Egg Storage a Complex Problem, by C. E. Baker.
No. 8. August, 1931. *p.* 664.
Temperature and humidity; odors; what air conditioning does; chemical factors; carbon dioxide.

Air Purity of Economic Importance, by F. E. Hartman.
No. 8. August, 1931. *p.* 665.
Use of ozone in air conditioning for egg storage; circulation; cost of ozone; brief discussion by John H. Ruckman. 2 i.

Experiences in Air Conditioning Office Buildings, by Samuel R. Lewis.
No. 7. July, 1931. *p.* 541.
Problems in comfort conditioning; shafts are chimneys; windows; unit systems; air inlets; corridors as return ducts; requirements of office conditioning plants; a typical system; use of unit coolers; cost of conditioning offices. 9 i.

Cold Water to Circulate Through Radiators in Summer.
No. 1. January, 1931. *p.* 93.
(Interviews of Interest); research laboratory of A. O. Smith Co., Milwaukee; interview with E. W. Burgess; the building; windows sealed; columns accommodate piping; air supply; cold water circulated in radiators in summer. 2 i.

Selecting CO_2 Air Cooling Equipment, by A. N. Chandler.
No. 9. September, 1931. *p.* 756.
Compressors and their location; condensers; Btus removed in condenser per ton of refrigeration—single compression; size of condenser oil traps and suction separators; receiver; size of receiver; evaporating equipment; cooling tower and water pumps; pipe connections; plan of typical plant in a theater. 8 i.

Air Conditioning for Homes—Cooling, by S. M. Anderson.
No. 5. May, 1931. *p.* 410.
Amount of cooling; provisions for future cooling; spray cooling unit; deep wells; amount of water; refrigeration equipment; dampers; control. 4 i.

Baltimore & Ohio Air Conditions Its "Columbian."
No. 7. July, 1931. *p.* 560.
B. & O. announces first completely air conditioned train. 5 i.

Air Conditioning—Humidifying and Dehumidifying

An Introduction to Drying, by Malcolm Tomlinson.
No. 6. June, 1931. *p.* 473.
Drying known by various names; seven fundamental methods; selecting the method; air movement; drying factors; vapor pressure; vacuum and boiling point; vaporization—absorption; heat required; rate of drying; drying with air; with superheated steam; classification of driers; drying cycle; drying curve. 5 i.

Charts Show Fundamentals of the Drying Process, by Malcolm Tomlinson.
No. 12. December, 1931. *p.* 1017.
The factors involved in drying; effect of the factors on the drying rate; relative humidity recorders; valves, switches, etc.; fundamentals of the drying process charted; the necessity for proper control. 8 i.

Helium as Medium in Drying, by Charles S. Mann.
No. 2. February, 1931. *p.* 188.
Comments on "Helium as a Circulating Medium in Drying Operations," November, 1930, issue; loss of helium in batch drying process.

Maintenance of Air Washers, by Samuel R. Lewis.
No. 6. June, 1931. *p.* 536.
("Open for Discussion"); comments on "Maintenance of Air Conditioning Equipment," by William A. Hanley, November, 1930, issue; construction of a non-metallic air washer; water-tight roof for protection. 1 i.

Practical Results of Air Conditioning in Textile Mills, by James W. Cox, Jr.
No. 1. January, 1931. *p.* 30.
Necessity for air conditioning; acceptance by operators; how moisture affects raw materials; definite conditions vital; results obtained. 1 i.

Air Conditioning Vital in Silk Spinning.
No. 4. April, 1931. *p.* 358.
(Some Reports on Research—interview with M. L. Duckman); description of silk mill of Oscar Heineman Corp. (Chicago); strength and humidity; records important; recirculation; preventing condensation; humidification; exhaust system for receiving room; testing the threads. 8 i.

Air Conditioning of Press Rooms, by I. C. Baker.
No. 7. July, 1931. *p.* 553.
(From address at convention of United Typothetae of America); properties of air; necessity of humidification; variations in outside air; effect on paper, paper manufacturers, press room operation; temperatures and humidities for press rooms; initial and operating costs of conditioning with and without refrigeration; savings. 6 i.

Uses of Air Conditioning Equipment in the Manufacture of Gas, by Malcolm Tomlinson.
No. 8. August, 1931. *p.* 685.
Reaction necessary for removal of hydrogen sulphide from gas depends on presence of water; correct humidity for gas stream determined; effect of control of humidity.

Unit Conditioners Supplement Central Air Conditioning Systems, by Rush D. Touton.
No. 10. October, 1931. *p.* 832.
Wide range of atmospheric conditions in a cigar plant offers opportunities for use of unit air conditioners; central systems used; fifteen units provide flexibility for curing process; packing departments kept at lower dew points; conditioning a department to be enlarged; prepared tobaccos kept cool and moist; unit used in conjunction with larger circulation system; pre-conditioning arrangement; unit conditioner permits additional production. 3 i.

Humidity Controlled in Produce Terminal, by Clarence E. Baker.
No. 1. January, 1931. *p.* 36.
Pennsylvania Produce Terminal, Philadelphia; cold water from wells; operation of compressors; control of brine flow; control of relative humidity; sprinkler pipes filled with brine to prevent freezing. 2 i.

Flexibility Keynote of Air Conditioning System for Combined Office Building and Laboratory, by W. R. Woodward.
No. 9. September, 1931. *p.* 763.
12-story building at East Pittsburgh works of Westinghouse Electric and Manufacturing Company air conditioned; advantages of cleaning air; heat load varies; conditions maintained; air conditioning the laboratory; unit areas individually controlled; air discharged at high level; three stacks remove heat; the question of windows; control; air conditioning the offices; control; return air; windows padlocked; condensation. 6 i.

Indicating Instruments Aid Operation of Heating and Air Conditioning System, by S. A. McGuire.
No. 1. January, 1931. *p.* 15.
American Academy of Arts and Letters Building, New York; forced draft when firing up; air is washed; discharge and duct velocities; control of wet and dry bulb temperatures; controlling temperature in room with skylight; thermometers and gages; reheaters and preheaters; test of ventilation system. 11 i.

Heating and Humidifying Art Museums, by Samuel R. Lewis.
No. 11. November, 1931. *p.* 910.
Difficulties in heating such buildings; pre-warmed air introduced at doors; section through air conditioning equipment in Toledo Museum of Art; inlets; long radiators in recesses in baseboard; studies made with models; humidity; arrangement of air distribution system; walls and roof insulated; air supply to offices; "platter" ceilings; unit heaters for stage in auditorium; hot water heating system zoned; skylights whitewashed in summer. 9 i.

Air Conditioning for Homes—Humidification, by S. M. Anderson.
No. 4. April, 1931. *p.* 306.
Window condensation tests; single and double windows; maintaining proper conditions; amount of heat necessary; amount of water evaporated; necessity of control; photo-electric cell used to control humidity; typical calculations. 4 i.

Air Conditioning—Ventilating

Registers Respond to "Deflector Treatment," by Henry G. Schnefer.
No. 1. January, 1931. *p.* 95.
Exhaust register discharged air; installation of deflector cured it; top supply register refused to emit air; how deflector corrected the fault. 2 i.

Duct Made from Old Drums.
No. 3. March, 1931. *p.* 274.
Exhaust duct in welding shop made by welding old carbide drums together. 1 i.

Re-Routing Ducts Without Charts, by Henry G. Schaefer.
No. 4. April, 1931. *p.* 316.
Rule-of-thumb for changing duct sizes; typical case; advantages of use. 1 i.

Turning Blades Reduce Duct Elbow Losses, by F. E. Wertheim.
No. 11. *November,* 1931. *p.* 915.
Importance of proper duct design; duct adjacent to elbow; typical elbows; aspect and radius ratio; chart for designing square elbows with turning blades; example shows use; bibliography. 7 i.

Ventilating and Piping a Modern Laundry, by W. H. Pierce.
No. 7. *July,* 1931. *p.* 572.
American Institute of Laundering at Joliet, Ill.; atmospheric conditions; amount of water evaporated; ventilating problems; eliminating chlorine danger; garage; heating the laundry; uses of steam; steam piping; pipe tunnel; supports; traps and return lines; liquid soap system; water system.

Avoiding Condensation in Laundries.
No. 9. *September,* 1931. *p.* 811.
Laundries need first class ventilating system.

Air Delivery—An Important Part of Air Conditioning, by Samuel R. Lewis.
No. 5. *May,* 1931. *p.* 404.
Test room at A. O. Smith Corporation; methods of supplying and exhausting air; the tests; results and conclusions. 8 i.

A Signal System, by the Staff of Clyde R. Place.
No. 10. *October,* 1931. *p.* 897.
Proper operation of fans and reducing valves in new Waldorf-Astoria Hotel (New York City) insured by a signal system; operation of the system; simplified wiring diagram. 1 i.

Control of Exhaust Systems in Apartment Buildings.
No. 8. *August,* 1931. *p.* 678.
("Open for Discussion"); comments by Lynn E. Davies, A. C. Willard, John R. Cooper and Samuel R. Lewis extending information in "Handling Kitchen Exhaust in an Apartment House," published in the November, 1930, issue. 5 i.

Exhaust from Kitchens, by H. L. Alt.
No. 2. *February,* 1931. *p.* 137.
(Open for Discussion); comments on "Handling Kitchen Exhaust in an Apartment House," by S. R. Lewis; odors from kitchens eliminated; fan enlarged; two typical systems; register sizes; higher static pressure necessary; effect of indoor-outdoor temperature difference. 2 i.

Talking Pictures Stress Theater Ventilator Noise Problem, by Wallace Waterfall.
No. 2. *February,* 1931. *p.* 138.
(Open for Discussion); comments on "Control of Sound in Buildings," by F. R. Watson; problem important in movie theaters.

Noise Silencing Combined with Ventilation.
No. 2. *February,* 1931. *p.* 186.
(Some Reports on Research); test installation of window ventilator and noise-silencer at bank in Hartford, Conn. 1 i.

Lining Duct Reduces Noise.
No. 2. *February,* 1931. *p.* 136.
Amount of reduction and lining.

Heating—General

Standardization of Nomenclature, by Harold F. Marshall.
No. 1. *January,* 1931. *p.* 91.
(Open for Discussion); comments on "Suggested Reforms in Heating and Air Conditioning Nomenclature," by S. R. Lewis; steam pressures; vacuum and vapor systems; traps; downfeed risers, square feet.

How Should Heating and Air Conditioning Terms be Revised?
No. 5. *May,* 1931. *p.* 390.
(Open for Discussion); letters from W. A. Rowe and D. Fraser Michie and resumé by Samuel R. Lewis on improving nomenclature; effective capacity of radiator. 3 i.

Refrigerators for Heating.
No. 2. *February,* 1931. *p.* 132.
Suggested use of refrigerating machine as a heat pump for warming buildings in Italy (from consul's report); system explained by H. J. Macintire; Carnot cycle; reversed Carnot cycle; problem shows process; objections to plan. 3 i.

The Architect's Design and Heat Economy, by Emery Stanford Hall.
No. 3. *March,* 1931. *p.* 203.
Balance necessary between design and heat economy; heat distribution; enclosures; air supply; occupancy; location of apparatus; systems; humidity; shafts; esthetic considerations. 9 i.

Preheating of Fuel Oil, by Kalman Steiner and Paul R. Unger.
No. 4. *April,* 1931. *p.* 297.
Underwriters' classification of oils; Baumé; need for preheating; viscosity and temperature; proper oil temperature; typical heaters and methods of installation; estimating coil surface; condensate; preparing oil for combustion; below-water-line heater; electric heaters; theory; temperature control; economics; heat transfer rate diagram. 10 i.

Heating Surface for Water Heating, by Rollo E. Gilmore.
No. 6. *June,* 1931. *p.* 487.
Formulas and simple rules of computation reviewed; closed type heater; open type heater; control; arrangement of trays; computing capacity; space for filters; hardness of water. 1 i.

Graphic Solution of Chimneys, by H. L. Alt.
No. 7. *July,* 1931. *p.* 564.
Charts enable design of heating plant chimneys; draft requirements may not determine height; basis of chart; draft losses; use of charts; typical examples; modifying the ideal chimney; low chimneys. 3 i.

Control of Heat, Light and Sound in Modern Buildings, by Edgar C. Rack.
No. 9. *September,* 1931. *p.* 734.
General information on the uses of insulation in building construction; windowless factory; sound insulation; heat insulation; appraisal of heat insulation; economic considerations; comparison of correct and economical thickness; research and materials for the future. 6 i.

Conservation—An Engineering Principle, by Josiah C. Moore.
No. 10. *October,* 1931. *p.* 860.
Importance of conservation; waste steam from angle furnace utilized; heat recovered from Diesel exhaust; a synchronized oil burner control; diagrams. 3 i.

The 4th Heating and Ventilating Congress at Brussels, by A. Beaurrienne.
No. 1. *January,* 1931. *p.* 8.
Heat necessary for a building (André Nessi); high pressures (A. Beaurrienne); radiant heat.

A. S. T. M. Committees.
No. 4. *April,* 1931. *p.* 291.
Committee D-5 on coal and coke; committee D-2 on petroleum products will define gross and net calorific values of fuels; sampling; activities of research committee on fatigue of metals.

Heating and Air Conditioning the Cleveland Union Terminal, by J. W. Carrow.
No. 2. *February,* 1931. *p.* 99. *Also see p.* 219, *March,* 1931.
The terminal; steam piped ¼ mile from electric company; forced hot water system used; concealed radiators; heat loss factors; hot water converters; circulating pumps; air introduced through waiting room seats; expansion tank; steam services; pressures for concessions; high pressure steam for refrigerating plant; two-pipe vacuum system heats part of terminal; preventing fire mains from freezing in track space; domestic water heaters and pumps; receiving tanks; vacuum and condensation pumps; foundations for machinery. 12 i.

Office Building Windows Weather-Stripped.
No. 3. *March,* 1931. *p.* 224.
(Some Reports on Research); interview with Wm. H. Seyfarth, supt., Transportation Building, Chicago; office building weather-stripped; cost and savings; coal consumption. 1 i.

Design Controls Cost of Heating, by Sterling S. Sanford.
No. 8. *August,* 1931. *p.* 637.
Proper architectural design of office buildings cuts heat loss; windows; double windows; enclosures for concealed radiators; preventing window drafts; store fixtures obstruct radiators; proper doors; stack effect; protect water piping; recirculation. 6 i.

Solution of the Ash-Handling Problem in a Large Office Building, by Henry G. Schaefer.
No. 11. *November,* 1931. *p.* 924.
Vacuum type ash-handling equipment in New York Life Insurance Co. building in New York City; the boiler plant; operation and lay-out of the ash-handling system. 2 i.

Cost of Equipment in a Junior High School, by A. L. Sanford.
No. 3. *March,* 1931. *p.* 202.
Folwell Junior High School, Minneapolis, Minn.; per cent of total cost and cost per cubic foot for each branch of the work.

Fuel Consumption Data for Schools, by John Howatt.
No. 4. *April,* 1931. *p.* 305.
(Discussion of "Fuel Consumption in Toledo Schools," December, 1930, issue); value of such data; some factors affecting consumption of fuel.

Heating—District and Central (Including Underground Steam Piping)

Locating Underground Lines Involves Compromises, by B. M. Conaty.
No. 3. *March,* 1931. *p.* 226.
(Discussion of "Determining the Location of District Heating Mains," by John F. Collins, Jr., p. 817, October, 1930, issue); the problems; stay near surface; rock and sub-surface water; use of bends. 2 i.

Locating District Steam Mains, by D. S. Boyden.
No. 4. *April,* 1931. *p.* 319.
(Discussion of "Determining the Location of District Heating Mains," October, 1930, issue); preliminary surveys; location in sidewalk; tunneling.

Plant Engineers Find Photographs Useful in Recording Valve Locations, by W. H. Wilson.
No. 9. *September,* 1931. *p.* 810.
Comments on method used by Brooklyn Union Gas Company applied to underground industrial piping; photographs used to check parts of reseating machine. 2 i.

How Harvard Heats a Hundred Halls, by G. K. Saurwein.
No. 5. *May,* 1931. *p.* 387.
Early methods used; steam distributed to buildings from electric company plant through well-planned system of tunnels, with hot water converters in building basements; the tunnels; returning condensate saves 10 per cent; distributing heating charge; insulation; plan of tunnels and buildings. 6 i.

Turbine Cuts Steam Waste in Heating and Power Plant, by D. D. Kimball.
No. 12. *December,* 1931. *p.* 996.
Development of central heating and power plant for Berea College, Berea, Kentucky; first plant installed in 1900; equipment; service extended in 1909; remote buildings supplied with 40-50 lb. steam; plant sells power; new boilers installed in 1923 and 1927; power demands caused exhaust steam waste; installation of turbine conserves exhaust steam; auxiliary equipment; plant has high rating for efficient operation; chief engineer and consulting engineer. 3 i.

Paris District Heating System Handicapped, by A. C. Coonradt.
No. 6. *June,* 1931. *p.* 535.
("Open for Discussion"); comments on "Steam Piping for New District Heating System in Paris" by Phillippe Schereschewsky, November, 1930, issue; load density; bled steam; advantages of district heating; J. H. Walker comments on by-product generation of power. 1 i.

Over a Billion Lb. of Steam per Year.
No. 7. *July,* 1931. *p.* 570.
Grand Central Terminal zone in New York City supplied with steam for heating and power by New York Steam Corp.; metering; pump room; steam lines. 6 i.

Electric Boilers Flatten Hydro System Load Curve—Steam Used for District Heating.
No. 7. *July,* 1931. *p.* 579.
(Some Reports on Research); interview with J. G. Glassco,

manager, Hydro Central Heat, Winnipeg; supplies downtown district; water tube boilers; electric boilers improve load factor; steam produced; steam main; rates for steam. 2 i.

District Heating System Supplements Municipal Power Plant, by Ludwig Wahl, Paul Reschke and F. E. Giesecke.
No. 11. *November,* 1931. *p.* 904.
Hot water district heating system in Dresden, Germany; development; heating system improves over-all efficiency of municipal power plant; features of the system; two flow lines, one return line; concrete pipe conduits; static head; heat exchangers; underground piping; connections to buildings; connecting new customers; distribution chamber in power house; condensate; heat demand; total heat delivered; production of steam and electricity; hospitals good customers. 9 i.

Heat Accumulator Stores Hot and Cold Water.
No. 12. *December,* 1931. *p.* 1012.
Large tank stores heat to supply peak demands of central hot water heating system in Hamburg, Germany; dimensions; capacity; outlets and inlets; electric welded.

Two Supply Mains Used for Central Hot Water Heating, by S. R. Lewis.
No. 6. *June,* 1931. *p.* 464.
Two supply mains at different temperatures used for central hot water heating in Sweden; use of welded steel section radiators; interview with Prof. Gille of Stockholm.

Heating—Hot Water, Steam, Vacuum, Vapor, Unit Heaters

Use of Condensation Meters in Heating Systems, by B. M. Conaty.
No. 2. *February,* 1931. *p.* 130.
Use of meters in industrial plants; dumping type; rotary; use of surge tank; capacity of receiver necessary; two meters often desirable; economizer arrangement; accuracy of meters; attention necessary; piping of the meters; application to vacuum and gravity systems. 3 i.

81,739 Reduction in Annual Heating Cost Indicated by Consulting Engineer's Study, by Samuel R. Lewis.
No. 12. *December,* 1931. *p.* 1013.
Need for a thorough study of heating costs; cost of heating a typical foundry with pipe coils and salamanders; no heat regulation; heat loss, temperature gradient, coefficients, stack effect, infiltration, tabulation; estimated heat loss if unit heaters were installed; initial cost of units; table of estimated savings. 4 i.

How a Vacuum Return Heating System was Inspected and Improved, by W. H. Wilson.
No. 6. *June,* 1931. *p.* 538.
(Practical Piping Problems); thorough test made; traps tested; stop cock worn; vacuum gages an aid; a handy radiator tester. 3 i.

Low Vacuum on Heating Return Lines.
No. 5. *May,* 1931. *p.* 408.
Causes of low vacuum on heating return lines.

Plate Glass Windows.
No. 6. *June,* 1931. *p.* 540.
Use of radiator shield between radiators and plate glass windows recommended by insurance companies.

Heating and Air Conditioning the Carbide and Carbon Building, by A. McCawley.
No. 1. *January,* 1931. *p.* 37.
General description of Chicago office building; piping over 2½-in. welded; vacuum heating system zoned; control of temperatures and pressures; air supply humidified and filtered; ducts; dirt trap bushing on radiators. 7 i.

Coal and Ash Handling for Boilers Fifty Feet Under Chicago River, by T. H. Monaghan.
No. 2. *February,* 1931. *p.* 116.
Merchandise Mart, Chicago; boilers; boiler and pump rooms underground; coal bunkers and conveyors; stokers; handling the coal; weigh larry; ashes removed through tunnel. 7 i.

Boilers Installed in Office Building Pent-House.
No. 2. *February,* 1931. *p.* 112.
Low pressure boilers for heating and domestic hot water located on roof of Eastern Outfitting Co. office building in Los Angeles, Calif.; burn oil or gas; piping from tank under sidewalk; oil pumps; atomizing air; the gas system. 2 i.

Combination Steam and Hot Water Systems Heat Court House and Jail, by H. A. Durr.
No. 3. *March,* 1931. *p.* 214.
Cook County, Ill., criminal court house and jail; cell buildings; heating systems; steam purchased; heat converters; hot water heating system; feeding radiators above overhead main; steam heating system; ventilation; ventilating record vault; gages and control. 6 i.

All-Steel-and-Glass Building Proves Economical to Heat, by A. I. Snow.
No. 10. *October,* 1931. *p.* 848.
Office of Worcester Pressed Steel Co., Worcester, Mass.; forced hot water system used; location of radiation; control of temperatures; turbine and motor drive circulating pump; exhaust steam heats water; fuel used. 2 i.

Unit Heaters Save Floor Space in Skyscraper Entrance, by Henry G. Schnefer.
No. 10. *October,* 1931. *p.* 862.
Unit heaters over revolving door heat vestibule; capacity; control. 2 i.

Records Show How to Save Heating Steam.
No. 10. *October,* 1931. *p.* 821.
Record system used by Building Managers' Association of Chicago; the charts and how to use them; graphical records; lowest possible unit steam consumption can be obtained; applicable to all types of buildings. 4 i.

Lack of Inspection Causes Steam Waste, by W. T. Jones.
No. 12. *December,* 1931. *p.* 1020.
Lack of inspection of radiator traps results in waste of steam; vent from vacuum pump blowing steam; return main; cooling leg; trap plugged with dirt.

How to Design the Piping for a Combined Forced and Gravity Circulation Reversed Return Hot Water Heating System, by F. E. Giesecke.
No. 6. *June,* 1931. *p.* 458.
System in 4-story dormitory at Texas A. & M. college; identifying radiators; the problem; proper procedure; riser connections; use of orifices; tolerances; balancing circuits; system checked in operation. 8 i.

Method of Heating and Ventilating a Small School, by Samuel R. Lewis.
No. 10. *October,* 1931. *p.* 844.
Twelve-classroom elementary Burroughs school in Toledo, Ohio; construction of building; radiators above air supply openings; steel plates form duct bottoms; air distribution; auditorium-gymnasium; addition of stokers will increase boiler capacity; steam at or below atmospheric pressure; control of steam; radiators in toilet rooms; location of thermostats; air intakes; total and unit costs of the plant. 6 i.

The New Hotel Waldorf-Astoria—A Description of the Heating and Piping Systems, by the Staff of Clyde R. Place.
No. 4. *April,* 1931. *p.* 275. *Also see p.* 369, *May,* 1931.
General description of New York hotel; plan of girder space; plan of sub-basement; importance of uninterrupted service; steam and electricity from outside; two-pipe vacuum system; risers and mains; returns and drips; intermediate pressure steam; steam header; vacuum cleaner piping. 8 i.

Heating—Warm Air

Large Space Warm Air Heating, by O. W. Kothe.
No. 6. *June,* 1931. *p.* 479.
Heating an industrial plant; performance tests; fans; heating a church; general comments. 6 i.

Warm Air Heating Plant Protects Sugar in Storage.
No. 9. *September,* 1931. *p.* 761.
Warm air heating plant at Gramercy, La., refinery of Colonial Sugars Company prevents absorption of moisture in refined sugar in storage; size of warehouses; natural gas burned. 5 i.

Warm Air System Conditions Lodge Hall, by Platte Overton.
No. 8. *August,* 1931. *p.* 652.
Application of direct fired, hot blast system in Masonic Temple at Burlington, Wis.; oil-fired heater; air recirculated; inlets; deep well water used in air washer for summer cooling; how the system was designed; complete computations; humidity control; circular equivalents of rectangular ducts; friction in ducts; temperature control; diffusion of air; heater size; fan and motor; design of duct system; velocities. 7 i.

Eight Gas-Fired Units Heat Large Armory, by Louis L. Narowetz, Jr., and R. M. Moffitt.
No. 11. *November,* 1931. *p.* 937.
Description of 124th field artillery armory in Chicago; capacity, temperature rise, air velocity, etc., of units; recirculation ducts; figuring heat loss; products of combustion; temperature maintained. 3 i.

Trunk Ducts for Warm Air Heating, by O. W. Kothe.
No. 7. *July,* 1931. *p.* 578.
("Open for Discussion"); comments on "Trunk Ducts for the Fan Blast System of Warm Air Heating," p. 923, November, 1930, issue; turbulence; double duct; plaster and brick lining; operation of fans.

Trunk Ducts for Warm Air Heating Systems, by James J. Finan.
No. 12. *December,* 1931. *p.* 1064.
(Open for Discussion); comments on "Trunk Ducts for the Fan Blast System of Warm Air Heating," by Platte Overton, November, 1930, issue. 2 i.

Piping—General

A Diagram for Gas Flow in Pipes, by Leonard L. Hohl.
No. 5. *May,* 1931. *p.* 393.
Use of Fanning formula in chart form; a steam flow problem; how to use the chart; pressure drop with butane flowing; viscosity of steam; discussion by John C. Reed, Edgar E. Ambrosius, and R. E. Gould on value of consistent units and limitations of the chart. 2 i.

Piping Used to Unload Finely-Ground Products.
No. 1. *January,* 1931. *p.* 32.
Cement piped from ship for building foundations (Merchandise Mart, Chicago); size of lines and pumps; amount of air. 2 i.

Largest Cast Iron Pipe.
No. 3. *March,* 1931. *p.* 213.
Telephone subway under Harlem River, New York; placing the pipe. 1 i.

Simplified Practice for Wrought Pipe and Fittings.
No. 1. *January,* 1931. *p.* 19.
Standard reaffirmed by standing committee of industry; degree of adherence.

A. S. T. M. Committee on Cast-Iron Pipe.
No. 6. *June,* 1931. *p.* 539.
Work of sectional committee during 1930 (from *A. S. T. M. Bulletin.*)

A. S. T. M. Committee Approves Piping Standards.
No. 10. *October,* 1931. *p.* 820.
Tentative standards on electric-fusion-welded, electric-resistance-welded, forge-welded, and lock-bar steel pipe and riveted steel and wrought iron pipe approved.

Some Odd Uses for Lead Pipe, by William Anderson.
No. 7. *July,* 1931. *p.* 635.
Use of lead as gasket; uses of lead filings.

How to Install and Care for Gages of the Bourdon Tube Type, by John A. Masek.
No. 9. *September,* 1931. *p.* 727.
Types; selecting size; selecting style; pressure range; single spring; vacuum and compound; double spring; effect of freezing; effect of heat; inlets and cocks; piping for gages; correcting for water column; the gage board; testing; overpressure; why a gage may not register; causes of pointer being away from zero; leaks inside a gage. 14 i.

Recent Article on Bourdon Tube Gages Discussed, by J. O. Tragard.
No. 11. *November,* 1931. *p.* 939.
(Open for Discussion); comments on "How to Install and Care for Gages of the Bourdon Tube Type," September, 1931, issue; standard sizes; selecting size; steel springs; self-draining; heat of steam; water column; use of maximum hand; author replies to comments. 1 i.

Suitable Metering Devices Aid Economical Operation; by W. H. Wilson.
No. 5. *May,* 1931. *p.* 451.
(Practical Piping Problems); use of flow meters; checking compressed air lines; checking vacuum; portable meters; piping connections; water meter testing connections. 2 i.

Undetected Leaks Waste Money, by W. H. Wilson.
No. 7. *July,* 1931. *p.* 633.
(Practical Piping Problems); example of leaks found in industrial piping lines; points to watch; importance of stopping them. 3 i.

Care of Valve Stems—Opening Stuck Valves, by W. H. Wilson.
No. 8. *August,* 1931. *p.* 723.
(Practical Piping Problems); care of valves; how to open a valve which is stuck; opening a water valve; care of valves before installation. 1 i.

Uses of Check Valves in Industrial Piping Systems, by W. H. Wilson.
No. 12. *December,* 1931. *p.* 1066.
(Practical Piping Problems); use on pump discharge piping; on paint spraying equipment; on a hoist; on railway car brake testing lines. 3 i.

Piping Maintenance in Freezing Weather, by W. H. Wilson.
No. 10. *October,* 1931. *p.* 893.
(Practical Piping Problems); attention to check valves; gate valve damaged; anti-freeze solution; shut-off valves must be tight; watch these points. 4 i.

X-Ray Inspection of Welded Pipes and Pressure Equipment, by Herbert R. Isenburger.
No. 4. *April,* 1931. *p.* 304.
Installation for routine examination; use and value of X-rays; views showing porous weld, slag and porosity; cavity; sound gas weld; diagram of set-up for investigating welded tubing. 6 i.

How Welds Are Tested.
No. 12. *December,* 1931. *p.* 1021.
Description of methods of testing welds as given in a paper presented at the annual meeting of the *International Acetylene Association;* visual examiniation; hammer and anvil nick-break test; free bend test for ductility; tension test; hardness tests; specific gravity; stethoscope test; invisible ray tests; compression and drift tests; hydrostatic tests. 4 i.

Welded Piping, by G. K. Saurwein.
No. 6. *June,* 1931. *p.* 536.
(Open for Discussion); comments on "Higher Pressures and Temperatures as They Affect the Design, Installation, and Maintenance of Piping," by J. J. Harman, Dec., 1930, to Feb., 1931, issues; power plant piping welded; changes easily made.

Piping—Air

Piping Analysis Assures Minimum Compressed Air Cost, by A. W. Loomis.
No. 11. *November,* 1931. *p.* 899.
How the piping in a large mine was modernized; determining required capacity; laying out underground piping; computing the pipe sizes; pressure drop; choice of size an economic proposition; pressure for compressors; cost of air and pipe installed; installing compressors. 5 i.

Proper Practices to Observe for Vacuum Cleaner Piping Systems, by Lester C. Smith.
No. 10. *October,* 1931. *p.* 852.
Central vacuum cleaning systems; ratings—sweeper capacity; sweeper chart; designing the piping; charts available; judgment needed; right and wrong arrangements of piping; specifications for cleaning systems; vacuum in inches of mercury lost in pipes 100 ft. long; operation and maintenance. 9 i.

Installing Industrial Air Piping, by W. H. Wilson.
No. 11. *November,* 1931. *p.* 985.
(Practical Piping Problems); troubles with air piping; use of separators; anti-sweat insulation; alcohol clears ice from line; piping the receiver; moisture; points to consider in installation. 2 i.

Piping—Hydraulic

How to Figure Amount of Water Used by Hydraulic Presses, by F. G. Schranz and W. L. DeLaney.
No. 2. *February,* 1931. *p.* 135.
The cycle; returning the ram; types of presses; auxiliary rams; two-pressure system; amount of water; theoretical power; allowance for leakage. 2 i.

Methods of Supplying Fluid to Hydraulic Press Installations, by F. G. Schranz and W. L. DeLaney.
No. 12. *December,* 1931. *p.* 1003.
Importance of fluid supply; the accumulator; intensifiers; determining diameter of high pressure ram; types of pumps used; single pressure systems; multiple pressure systems; characteristics and uses of each. 2 i.

Hydraulic Press Operation, by Mark W. Roe.
No. 4. *April,* 1931. *p.* 360.
(Discussion of "How to Figure Amount of Water Used by Hydraulic Presses," February, 1931, issue); clamp on ram when idle stroke is too great; multiple-pressure operation; accumulator.

High Pressure Hydraulic Systems, by John H. Ruckman.
No. 5. *May,* 1931. *p.* 382.
Trend toward high pressures; power and pressure; central stations; large plant broken up in units; control valves; leakage; shut-downs; accidents; damage to piping inside and outside plant; system of maintenance needed; inspection; records; fluid must be pure. 6 i.

Linseed Oil Manufacturing Process Depends on an Extensive Piping System, by J. Gordon Fletcher.
No. 8. *August,* 1931. *p.* 668.
Manufacturing process; linseed oil as hydraulic medium; the pumps; presses operated in groups; timing; piping; lines sectionalized; clean lines essential; make-up oil; packing. 2 i.

Piping Arrangements in a Gate Lifter, by C. G. Moon.
No. 12. *December,* 1931. *p.* 1025.
Function of lock gate lifter; piping; ballast tanks; pumps; equalizing system; method of operation. 3 i.

How to Keep Hydraulic Equipment from Freezing, by W. H. Wilson.
No. 1. *January,* 1931. *p.* 96.
(Practical Piping Problems); steam heating an hydraulic press; the piping necessary; bulk-head in pipe tunnel affords protection; use flanges and unions liberally. 1 i.

Hydraulic Piping Damaged by Freezing, by W. H. Wilson.
No. 2. *February,* 1931. *p.* 187.
(Practical Piping Problems); loosen packing box gland bolts on hydraulic press cylinders, accumulators, and similar equipment to prevent damage from freezing; how one press was damaged; steam forging hammers. 1 i.

Piping—Oil and Gas

Piping Oil for Industrial Processes, by Paul R. Unger and Kalman Steiner.
No. 1. *January,* 1931. *p.* 9.
Plant of Indestro Manufacturing Co., Chicago; oil storage; inside and outside piping; strainers; pumping; choice of a piping system; air piping; pipe sizes; relation between f and Dus/Z; sample calculations. 6 i.

A. G. A. Joint Research.
No. 2. *February,* 1931. *p.* 185.
(Some Reports on Research); interview with R. M. Conner on gas line research at American Gas Association laboratory in Cleveland; gas leakage expensive; universities cooperate; old joints tested; methods of repairing studied; leak clamps; effect of temperature changes. 1 i.

How Oxygen and Acetylene Are Piped in a Manufacturing Plant, by W. A. Slack.
No. 5. *May,* 1931. *p.* 407.
Plant of Naylor Pipe Co., Chicago; gas house; acetylene line; disposal of sludge; carbide storage; oxygen manifold room and piping; flash-backs; importance of clean pipe. 4 i.

The New 950-Mile Natural Gas Pipe Line from Texas to Chicago, Ill.
No. 10. *October,* 1931. *p.* 842.
Views along the line; kind of pipe; rate classifications. 10 i.

Reclaiming Arrangement for Waste Oil, by W. H. Wilson.
No. 9. *September,* 1931. *p.* 809.
(Practical Piping Problems); arrangement for collecting and reclaiming waste oil leaking from transmission lines in industrial plants; construction of tank. 1 i.

Fabrication of a Pipe Special.
No. 12. *December,* 1931. *p.* 1016.
Welded pipe special for a natural gas line; reducer at one end; formula for number of cuts; saddle plates welded on. 1 i.

Piping—Refrigeration

Factors Affecting the Design of Evaporators, by Herman Vetter.
No. 1. *January,* 1931. *p.* 40.
Properties of water, ammonia, carbon dioxide; principle of evaporator; flash type; direct expansion; liquid feed at top; flooded type; indicating liquid level; vertical tubes; shell and tube cooler; baudelot cooler; surface required; heat transfer coefficients; factors affecting design; influence of brine velocity; gas velocities; comparison with boiler. 13 i.

The Design of Evaporators, by Edgar E. Ambrosius and John C. Reed.
No. 4. *April,* 1931. *p.* 317.
(Discussion of "Factors Affecting the Design of Evaporators," January, 1931, issue); amount of liquid flashing to vapor; velocity of suction line; heat transfer coefficients; some additional factors to consider. 6 i.

Piping Improvements Reduce Cost of Pumping, by Herman Vetter.
No. 10. *October,* 1931. *p.* 835.
Condenser water circulating system in a manufacturing plant revised to save power; loss in original and new suction lines, with detailed computations; test of new piping; question of purchasing a new pump; test run with new pump; comparison of old and new systems; reduction in power cost. 3 i.

Proper Care of Brine Aids Prevention of Corrosion, by R. C. Doremus.
No. 5. *May,* 1931. *p.* 372.
Research in corrosion prevention of refrigerating equipment; brine strength; electrolysis; acidity; alkalinity; tests; color scale for bromthymol blue, thymol blue, phenol red, cresole red, phenolphthalein; sodium dichromate; disodium phosphate; zinc dust; cost of corrosion retarders; decrease of concentration of sodium dichromate in calcium chloride brine; curves showing relative corrosion rates for iron and steel in various brines. 7 i.

Phenolphthalein as an Indicator.
No. 3. *March,* 1931. *p.* 273.
Use of phenolphthalein for indicating acidity or alkalinity of brine solutions; the solution; its color for pH values.

pH Method of Determining Acidity and Alkalinity.
No. 2. *February,* 1931. *p.* 134.
Explanation of pH values and their determination; precautions to observe when using sodium dichromate in brine solutions.

Piping—Steam (Including Steam for Process Work and Process Piping)

Handling Viscous Materials, by Lee P. Hynes.
No. 5. May, 1931. *p.* 363.
Conveying oils, greases, pitch, tar, waxes, syrups, etc., in piping; drop in elbows; relation of temperature and viscosity of oils; velocity; choosing the pump; steam jacketed and electrically heated pipe, pumps, etc.; heating jacketed vessels with oil; thermal storage of heater; typical job; filling system with oil; starting; contamination; control; insulation. 16 i.

Process Industries Piping, by C. L. Mantell.
No. 7. July, 1931. *p.* 635.
Extent of chemical process industries piping; substances piped; materials; factors to consider.

Higher Pressures and Temperatures as They Affect the Design, Installation and Maintenance of Piping, by J. J. Harman.
No. 1. January, 1931. *p.* 20.
Power required to operate valves; types of valves; factors affecting gate valve operation; unbalanced pressure on bottom of stem; increased cost of high pressure piping; effect of high temperature on design; range of temperatures; creep tests; safe stress curve for 0.30 carbon steel; equicohesive temperature; materials; foundry technique; volume of fluid in hydraulic and steam systems at various pressures; welding; standardization; care in handling valves. 18 i.

Higher Pressures and Temperatures as They Affect the Design, Installation and Maintenance of Piping, by J. J. Harman.
No. 2. February, 1931. *p.* 106.
Alloys for high temperature use; valve trim materials and requirements; new developments; cast, forged and welded pressure containers; pipe joints; type; welded piping; gaskets; bolts for flanged joints; general comments on high pressure-high temperature piping. 7 i.

Bending of Curved Pipes, by Sabin Crocker.
No. 5. May, 1931. *p.* 399.
A review and explanation of the theory and its practical applications; flattening theory; effect on stress distribution; safe stresses for curved pipe; temperature and creep; piping for 750 F and over; curves for determining rigidity multiplication factor and stress multiplication factor. 6 i.

Bursting Stress in High Pressure Piping, by Harvey A. Wagner. (Discussion by John J. Harman.)
No. 8. August, 1931. *p.* 658.
Birnie and Clavarino formulas; application of Birnie formula; elastic failure theories (Rankine, St. Venant, and Guest); Army Ordnance Department tests on thick-walled cylinders; closed cylinders with ends attached to walls; use of Barlow formula; when do closed end conditions prevail?; piping work analogous to open end conditions; Lamé formula. 5 i.

Curves Aid in Design of Thick-Walled Tubes and Cylinders, by F. E. Wertheim.
No. 10. October, 1931. *p.* 850.
Formulas for design of thick-walled tubes; curves simplify use of Clavarino formula; example shows use. 2 i.

Development of Clavarino Formula, by Harvey A. Wagner.
No. 11. November, 1931. *p.* 987.
Steps in the development of the Clavarino formula from the general equation to the form $t = r \times C$.

Metallurgical Requirements for High Temperature Steam Piping, by F. W. Martin.
No. 8. August, 1931. *p.* 673.
Development of use of high temperatures; pipe; fittings; valves; studs and nuts; conclusion. 5 i.

Piping for 1,000-Degree Steam, by J. H. Walker.
No. 4. April, 1931. *p.* 283.
Turbine installed at Delray plant of Detroit Edison Co. uses steam at 1,000 F; effect of increased temperature; turbine installation; tensile strength of metals at elevated temperatures; creep stress for steels; preliminary experiments; piping materials; fittings; piping design; provisions for expansion; center-pressure valve; joints; insulation. 5 i.

Designing High Temperature Steam Piping, by Arthur McCutchan.
No. 10. October, 1931. *p.* 825.
(Part I—Flexibility of 1,000 F line); lay-out of high temperature piping at Delray; reactions determined by grapho-analytical method; method of introducing flexibility at Issy Les Moulineaux Station of Paris Electric Co.; coefficient of expansion of 18 per cent chromium-8 per cent nickel piping used at Delray; design conditions; expansion; linear expansion of austenitic chrome-nickel and medium carbon steels; flexural rigidity of line; reduction of modulus of elasticity with increase in temperature; flexibility of pipe, valve, and fittings; method for one force described; bending moments; reacting forces; assumptions err on safe side; shear stress due to torsional moment. 9 i.

Designing High Temperature Steam Piping, by Arthur McCutchan.
No. 11. November, 1931. *p.* 918.
(Part II—Pipe joints for 1,000 F service); flexibility of *A. S. A.* flanged joints; effect of temperature difference on bolted joints; design of heavy flanged joint; creep characteristics of 10-in., 600-lb. flanges; spring absorbs creep; effect on life of joint; effect of spring on bolt stress due to temperature difference; bolts with full shanks and bolts threaded entire length; formulas for stress; gasket compression on side of joint which has pressure decreased by bending moment; load vs. change in length; reduction in modulus of elasticity with increase in temperature; stress vs. creep rate at 1,000 F; conclusions. 8 i.

Selecting Sterilizers, by Rollo E. Gilmore.
No. 1. January, 1931. *p.* 33.
Use; steam pressures; dressing sterilizers and autoclaves; accessories; sizes of cylindrical pressure sterilizers; built-in sterilizers; drum sterilization; steam and electric consumption. 2 i.

Selecting Sterilizers, by Rollo E. Gilmore.
No. 2. February, 1931. *p.* 119.
Disinfectors; air must be eliminated; steam consumption; instrument sterilizers; need for steam separator; sizes; steam and electric consumption; roughing-in dimensions; piping; utensil sterilizers; milk and bottle pasteurizers; bed pan washers; recessed construction; water sterilizers; steam and electric consumption; recommended sizes. 6 i.

Selecting Sterilizers, by Rollo E. Gilmore.
No. 3. March, 1931. *p.* 210.
Central water sterilizers; saline apparatus; water stills; types; operation; stills in conjunction with pressure type sterilizers; storage tanks for distilled water; steam, gas or electric consumption; non-pressure type sterilizers; diagrams of electric and gas heated water stills. 5 i.

Selecting Sterilizers, by Rollo E. Gilmore.
No. 4. April, 1931. *p.* 320.
Hot air sterilizers, blanket warmers, bed pan and solution cabinets; dimensions; sterilizer connections and service; vents; air brake, waste and funnels to prevent contamination of distilled water; steam demand; sterilizer tests. 2 i.

Piping an Industrial High Pressure Plant—Electric Power and Process Steam Loads Balanced, by J. V. Edeskuty.
No. 3. March, 1931. *p.* 189.
Waldorf Paper Products Co. plant, St. Paul, Minn.; plant remodeled; cost; division of cost; heat balance; high pressure piping, design, tests, flow in, expansion and supports; steam purifiers; insulation; boiler feed, blow-off, low pressure piping; identification; white water heaters. 10 i.

Piping an Industrial High Pressure Plant—Electric Power and Process Steam Loads Balanced, by J. V. Edeskuty.
No. 4. April, 1931. *p.* 293.
Description, operation, control, estimating value, calculating capacity, valves, etc., for steam accumulator installed at Waldorf Paper Products Co.; steam flow diagram. 2 i.

High Pressure Steam and the Modern Industrial Plant, by E. H. Barry.
No. 7. July, 1931. *p.* 547.
Trend toward high pressure; opportunities for economies where process steam is used; by-product power; secondary power; reducing cost of power; high pressure steam; reheating; supplying process steam for a typical plant; lay-out; calculations; use of Mollier diagram; demand not constant; allow for future trends; reducing valve and desuperheater. 4 i.

Process Steam and Power, by S. H. Hemenway.
No. 10. October, 1931. *p.* 858.
(Open for Discussion); comments on "High Pressure Steam and the Modern Industrial Plant," by E. H. Barry; use of bleeder turbines; savings made; proper use and control of process steam; an oil refinery installation. 1 i.

Oil in Exhaust Steam Reduces Heat Transfer, by R. P. Tobin.
No. 12. December, 1931. *p.* 1028.
Heat transfer in a radiator; temperature gradient; rate of heat transfer; film resistance; oily deposit or scale; prevention of contamination; careful oil selection for prime movers necessary; method of application important; direct application; simple injection; injection with atomizer; removing oil from exhaust steam. 5 i.

Piping High, Intermediate and Low Pressure Steam Economically, by H. L. Colby and Francis A. Westbrook.
No. 11. November, 1931. *p.* 933.
New boiler plant for Mason Regulator Co., Boston, Mass., supplies 400-lb. steam for testing, 150-lb. steam for process and steam for heating; piping lay-out; arrangement of reducing valves; equipment used; boiler feed; by-pass for feed water heaters; oil burner and control; steam and electric oil preheaters; piping materials. 5 i.

Piping Plant Atkinson, by E. C. Gaston.
No. 6. June, 1931. *p.* 465.
60,000 kw. plant of Georgia Power Co.; importance of piping; controlling factor in design; principal equipment; three piping classes; materials; joints; heat balance diagram; high pressure bolts of special steel; flange finish and gaskets; valves and fittings; piping gallery; responsibility of piping contractor; provision for future units; no by-passes around feedwater regulating valves; cast iron circulating water discharge line; analysis of stresses in piping; study of insulation; insulation used; canvas jackets; insulation of hot air ducts; costs of piping per kw. 8 i.

Piping Reliability—of Importance in Power Plant Near Arctic Circle, by R. A. Hanright.
No. 9. September, 1931. *p.* 741.
Power plant for grain elevator of Department of Railways and Canals at Fort Churchill, Canada; boilers, economizers, turbo-generators; steam at 650 F; plan and section of power house; concrete pipe tunnel; cast iron water lines; insulation and support; by-pass from main steam header to 60-lb. line; make-up feed water; handling condensate; reliability essential; plant operates three months per year; diagram of power piping; piping schedule; contractors, engineers, etc. 8 i.

Installing a 3,400-Ft. Overhead Steam Line, by L. C. Winkelhaus.
No. 12. December, 1931. *p.* 999.
4-in. wrought iron welded line for conveying 150-lb. steam for car heating at Chicago & North Western Railway Company's express terminal; estimating needed capacity; pipe sizes used; providing for expansion; supporting the line; details of pipe support towers; pipe covering; bucket traps; testing the line. 11 i.

Canadian Pacific Locomotive Operates on 1,350 Lb. Pressure.
No. 10. October, 1931. *p.* 831.
Brief review of features of "8,000" type. 2 i.

Steam from Contented Reducing Valves, by Henry G. Schaefer.
No. 5. May, 1931. *p.* 397.
Use of two small reducing valves for supplying steam for heating; typical example and method of sizing; diagram showing lay-out; arrangement offers gradual expansion. 1 i.

Flow Through Valves, by M. T. Martin.
No. 7. July, 1931. *p.* 577.
(Open for Discussion); comments on "Sizing Pressure Regulators," p. 416, May, 1930, issue; determining velocity of steam through port; method.

What Size Reducing Valve? by H. P. Adams.
No. 9. September, 1931. p. 767.
(Open for Discussion); what is proper size? need for automatic control; use of thermostatic valves; typical lay-out; velocity through orifice; formula for pounds of steam; capacities of pressure reducing valves (100 lb. to 50 lb. or less); Henry G. Schaefer comments on velocities. 1 i.

Don't Always Condemn the Trap, by T. H. Rea.
No. 9. September, 1931. p. 808.
Diagram of installation in which trap refused to work at low pressures but performed satisfactorily at high; force available to open traps; high steam velocity thought to be the cause; steam superheated—no condensate formed. 1 i.

Shortening an Inaccessible Pipe Coil, by W. H. Wilson.
No. 2. February, 1931. p. 187.
(Practical Piping Problems); coil obstructed by heavy stand; how the coil was shortened by means of cutting torch and welding. 1 i.

The Inside of the Pipe Line, by W. H. Wilson.
No. 3. March, 1931. p. 272.
(Practical Piping Problems); inside condition of piping important; nipple worn by water; pipe thread cut; elbow worn; keeping line in good condition. 2 i.

Joints in New Steam Line Cut, by W. H. Wilson.
No. 8. August, 1931. p. 724.
(Practical Piping Problems); possible reasons for joints in 125-lb. line being cut by steam; remedies. 1 i.

Small Pipe Coils Used to Reduce Steam for Heating.
No. 9. September, 1931. p. 812.
Small-size pipe coils arranged to reduce steam for heating for various parts of an industrial plant and office building; diagrams show how system is installed and operated; method of supplying hot water. 5 i.

Supports and Anchors for Piping—Three Typical Problems, by G. W. Hauck.
No. 5. May, 1931. p. 414.
Connections to turbines and steam driven auxiliaries; anchoring turbine header; exhaust connections; connection from turbine to overhead main; preventing strain on throttle valve. 5 i.

Pipe Supports, by T. M. Dugan.
No. 8. August, 1931. p. 725.
Diagram of commonly used support for overhead steam mains. 1 i.

Installing Box Unions, by W. H. Wilson.
No. 4. April, 1931. p. 361.
(Practical Piping Problems); a right and wrong way to install box unions; typical examples; lip worn away; face union so flow will not strike seating face. 2 i.

Piping—Water

Paper Mill Improves Product Through Piping Changes, by Max W. Benjamin.
No. 7. July, 1931. p. 562.
Port Huron Sulphite and Paper Co. improves screen room white water system; lay-out; provisions for cleaning; copper pipe; joints; installation; make-up water; flow diagram. 2 i.

Piping a Pumping Station, by Orville B. Carlisle and Duane E. Kennedy.
No. 8. August, 1931. p. 642.
Western Avenue pumping station, Chicago; 11-mile tunnel through rock; gate valve in suction piping; water for condensers; header system in pipe vault; sectionalizing and valving headers; control of motor-operated valves; velocities in piping; expansion joints; anchorage; water hammer; reinforcing large fittings; meters; check valve in pump discharge; insulation of pipe; care in installation. 7 i.

Piping System for Power Tube Cooling Water at Radio Station KDKA, by E. M. Sollie.
No. 10. October, 1931. p. 839.
Amount of power dissipated; flow of water through the two systems used; diagram of the system; amount of water and temperature rise; centrifugal pumps; cooling pond. 4 i.

Hot Water Storage Tank Connections Improved, by Henry G. Schaefer.
No. 1. January, 1931. p. 92.
Cold make-up water carried through the hot water; complaints; main supply taken from different tapping. 1 i.

Proper Pipe Line Support.
No. 10. October, 1931. p. 895.
Underground water line in industrial plant improperly supported; how the break was repaired; how welded joint was broken. 2 i.

Water Supply for an Aquarium.
No. 12. December, 1931. p. 1032.
Pumps and water supply for John G. Shedd Aquarium, Chicago. 1 i.

Editorials and General Topics

Has the Engineer Benefitted Mankind?
No. 8. August, 1931. p. 683.
Dr. C. E. Kenneth Mees, director of Research for Eastman Kodak Co., says the engineer has not benefitted mankind save in checking disease.

Rep'acing Manual Control.
No. 1. January, 1931. p. 89.

Cost of Operation and Maintenance.
No. 1. January, 1931. p. 89.

Economic Inefficiency.
No. 1. January, 1931. p. 89.

Check Cooling Equipment.
No. 1. January, 1931. p. 90.

That Thing Called Research.
No. 1. January, 1931. p. 90.

Keep Posted.
No. 1. January, 1931. p. 90.

Death for Air Pollution.
No. 1. January, 1931. p. 90.

Canadian Research.
No. 2. February, 1931. p. 183.

One Make of Equipment?
No. 2. February, 1931. p. 183.

Heating Costs.
No. 2. February, 1931. p. 183.

Degrees of Air Conditioning.
No. 2. February, 1931. p. 184.

Chicago Power Show.
No. 2. February, 1931. p. 184.

Know the Reason.
No. 2. February, 1931. p. 184.

Use of History Cards.
No. 2. February, 1931. p. 184.

Piping IS Important.
No. 3. March, 1931. p. 271.

The Home Atmosphere.
No. 3. March, 1931. p. 271.

Offices Need Air Conditioning.
No. 3. March, 1931. p. 271.

"In These Times."
No. 4. April, 1931. p. 357.

A Helpful Supplement.
No. 4. April, 1931. p. 357.

A Few Charts.
No. 4. April, 1931. p. 357.

"April Fool."
No. 4. April, 1931. p. 357.

An Important Transportation System.
No. 5. May, 1931. p. 447.

Spring Is Here!
No. 5. May, 1931. p. 447.

No Faucets Leaking.
No. 5. May, 1931. p. 447.

A Larger Group Needed.
No. 5. May, 1931. p. 448.

Mis'eading Publicity a Menace.
No. 6. June, 1931. p. 533.

Three Standard Formulas.
No. 6. June, 1931. p. 533.

More Clothes or Less.
No. 6. June, 1931. p. 534.

The Future of Refrigeration.
No. 7. July, 1931. p. 632.

Careful Instruction.
No. 7. July, 1931. p. 632.

Comfort on Wheels.
No. 7. July, 1931. p. 632.

A Debt of Gratitude.
No. 8. August, 1931. p. 721.

Fans as Stage Properties.
No. 8. August, 1931. p. 721.

Serving Mankind.
No. 8. August, 1931. p. 721.

Warm Air Heating.
No. 8. August, 1931. p. 722.

Refrigeration and Air Conditioning.
No. 8. August, 1931. p. 722.

No Absolute.
No. 8. August, 1931. p. 722.

Air Conditioning Prevents Accidents.
No. 9. September, 1931. p. 807.

Increased Net—Decreased Gross.
No. 9. September, 1931. p. 807.

Proper Piping Saves Money.
No. 10. October, 1931. p. 891.

Instruments Cut Costs.
No. 10. October, 1931. p. 891.

Proper Installation.
No. 10. October, 1931. p. 891.

Electricity for Heating.
No. 10. October, 1931. p. 891.

Reading Technical Journals—A Step Toward Success.
No. 10. October, 1931. p. 892.

Excessive Competition.
No. 11. November, 1931. p. 983.

"Professor of Economy."
No. 11. November, 1931. p. 983.

Survival of the Fittest.
No. 11. November, 1931. p. 984.

Air Conditioning Plays an Important Part in Our Lives.
No. 11. November, 1931. p. 984.

A Conference on Cost-Cutting.
No. 12. December, 1931. p. 1062.

The Economical Ounce.
No. 12. December, 1931. p. 1062.

The Wonders of Compound Interest.
No. 12. December, 1931. p. 1063.

Book Reviews

Vest Pocket Handbook.
No. 3. March, 1931. p. 225.

"Heating and Ventilation" Revised.
No. 5. May, 1931. p. 389.

Bulletin on Flow of Brine Issued.
No. 5. May, 1931. p. 416.

A Data Book on Gas Fuel.
No. 6. June, 1931. p. 482.

Treatise on Leather Belting.
No. 6. June, 1931. p. 482.

Second Edition of "Flow and Measurement of Air and Gases" Published.
No. 7. July, 1931. p. 636.

Pipe Welding Booklet Published.
No. 7. July, 1931. p. 634.

New Steam Tables and Mollier Diagram for High Pressures Announced.
No. 1. January, 1931. p. 29.

Journal of the American Society of Heating and Ventilating Engineers

January-December, 1931—Vol. 3, Nos. 1-12

ABSORPTION OF NOISE IN VENTILATING DUCTS, SOME STUDIES ON THE, G. L. Larson and R. F. Norris, Jan. 59
Accelerated Slacking Test for Coal, Feb. 178
ACOUSTICAL PROBLEMS IN THE HEATING AND VENTILATING OF BUILDINGS, V. O. Knudsen, Dec. 1035
AIR CONDITIONING AS APPLIED TO FURNITURE, FIXTURES AND OTHER INTERIOR WOODWORK, D. R. Brewster, Jan. 65
Purpose of Air Conditioning, Amount of Shrinkage of Wood, Protection of Furniture and Woodwork, Damage to Valuable Furniture and Woodwork, Preparation of Lumber, Equilibrium Moisture of Native Woods, Condensation on Interior Building Surfaces.
AIR CONDITIONING IN THE BAKERY, W. L. Fleisher, Feb. 158
Hydration Process in Modern Baking, Hydrogen-ion Concentration, Proteins, General Use of Air Conditioning, Fermentation, Conclusions.
AIR CONDITIONING IN THE PRINTING INDUSTRY, RELATION OF STANDARDIZATION TO, W. H. Carrier, April 335
AIR INFILTRATION THROUGH DOUBLE-HUNG WOOD WINDOWS, G. L. Larson, D. W. Nelson and R. W. Kubasta, July. 583
Program and Windows Used, Test Equipment Used, Test Procedure, One Hundred Per Cent Weatherstrip, Setting of Crack and Clearance, Weatherstripping, Presentation of Results, Discussion of Results, Frame Leakage, General Conclusions.
AIR POLLUTION FROM THE ENGINEER'S STANDPOINT, H. B. Meller, Jan. 70
Origin and Composition of Smoke, Effects of Smoke, Psychological Aspects of the Smoke Problem, Hygienic Aspects, The Responsibility of the Engineer, What Must Be Done.
AIRATION OF INDUSTRIAL BUILDINGS, PREDETERMINING THE, W. C. Randall and E. W. Conover, June 513
Allcut, E. A., Output of Heating Units at Various Temperatures, Nov. 966
American Construction Council Meeting, June 531
American Oil Burner Association Closes Successful Convention, June 531
Anderson Medal, F. Paul. A. S. H. V. E. Members Select Candidates for, Sept. 800
Annual Meeting (37th), Pittsburgh, Jan. 26-29, 1931.
Proceedings, March 238
Program, Jan., Feb. 80, 179
ANTHRACITE FOR DOMESTIC HEATING, UTILIZATION OF, Allen J. Johnson, Dec. 1050
Appearance Factors in Engineering Graphs, Feb. 157
A. S. H. V. E. Members Select Candidates for F. Paul Anderson Medal, Sept. 800
A. S. H. V. E. Research Laboratory, Report of, Aug. 700
A. S. H. E. Western Meeting, June 531
Bailey, E. P., to Manage Gas Division, July 629
Badgett, W. H., and F. E. Giesecke, Friction Heads in One-Inch Standard Cast-Iron Tees, May 430
Benjamin L. Claribel, and C. P. Yaglou and Sarah P. Choate, Changes in Ionic Content of Air in Occupied Rooms Ventilated by Natural and by Mechanical Methods, Oct. 865
Bibliography of the Bureau of Mines Coal Investigations, June 512
Bituminous Coal Conference November 16-21, 1931, Nov. 980
Bolton, R. P., Progress in Heating and Ventilating During the Past Quarter of a Century, Jan. 47
Breckenridge, W. T., Problems and Methods of Heating and Ventilating on Shipboard, Oct. 875
Brewster, D. R., Air Conditioning as Applied to Furniture, Fixtures and Other Interior Woodwork, Jan. 65
CANDIDATES ELECTED, Jan. 88
Feb. 182
March 270
April 356
May 446
June 532
July 631
Aug. 720
Sept. 806
Nov. 982
Dec. 1061
CANDIDATES FOR MEMBERSHIP, Jan. 87
Feb. 181
March 269
April 355
May 445
June 532
July 631
Aug. 720
Sept. 806
Oct. 890
Nov. 982
Dec. 1061
Carbon Monoxide Hazards, Especially Prevalent at this Season, Visualized in Motion Picture Film, Jan. 49
Carrier, Pres. W. H., to Visit Western Chapters, March. 263
Itinerary, April 353
Carrier, W. H., Relation of Standardization to Air Conditioning in the Printing Industry, April. 335
CHANGES IN IONIC CONTENT OF AIR IN OCCUPIED ROOMS VENTILATED BY NATURAL AND BY MECHANICAL METHODS, C. P. Yaglou, L. Claribel Benjamin and Sarah P. Choate, Oct. 865
Properties, Formation and Destruction of Ions, Measurement of Ionic Content of Air, Influence of Respiration and Transpiration on Ionic Content in Occupied Rooms, Outdoor Air Supply in Relation to Ionic Content, Artificial Ionization, Influence of Air-Conditioning Methods on Ionic Content, Summary, References.
CHAPTER REPORTS, Jan. 82
March 264
April 351
May 442
June 528
July 628
Sept. 802
Oct. 885
Nov. 980
Chicago Will Entertain Council Members, April. 353
Choate, Sarah P., and C. P. Yaglou and L. Claribel Benjamin, Changes in Ionic Content of Air in Occupied Rooms Ventilated by Natural and by Mechanical Methods, Oct. 865
Cleveland Engineering Society Selects New Quarters, Nov. 980
Cleveland Is Ready for Meeting and Exposition, Dec. 1056
Cleveland Prepares for Meeting and Exposition, Nov. 978
Close, Paul D., Estimating Fuel Consumption, May. 433
Code for Testing and Rating Concealed Gravity Type Radiation, Report on, Aug. 695
CODES.
Proposed Code for Testing Steam Heating Boilers Burning Oil Fuel, April. 338
COMBUSTIBLE NATURE OF SOLID FUELS, A STUDY OF THE, R. V. Frost, Sept. 771
Committee of Ten Officers Reelected, Aug. 717
Comparative Heating Costs, Jan. 75
COMPONENTS OF AIR IN RELATION TO ANIMAL LIFE, Jan. 69
Experiments Conducted, Atmosphere of Nitrogen and Oxygen.
CONDUCTIVITY OF CONCRETE, F. C. Houghten and Carl Gutberlet, Sept. 778
Results of Various Investigators, Method of Tests to Determine Variation of Conductivity of Concrete with Age, Summary and Conclusions, Bibliography.
Conover, E. W., and W. C. Randall, Predetermining the Airation of Industrial Buildings, June. 513
Constant Temperature Drying Room, April. 329
CORROSION IN STEAM AND CONDENSATE LINES, SOME FUNDAMENTAL CONSIDERATIONS OF, R. E. Hall and A. R. Mumford, Nov. 943
Council Meeting in New York in December, Jan. 86
Council Meeting in Buffalo, Nov. 981
Council Meeting in Buffalo Nov. 9, Dec. 1060
Davies, L. E., The Measurement of the Flow of Air Through Registers and Grilles, April. 325
DEATHS.
Hubbard, Allen, Jan. 86
Faulkner, D. H., March. 268
Kauffman, Rufus, March. 268
Gormly, Patrick, March. 268
Cosgrove, W. M., July. 629
Weaver, John R., Aug. 719
Pryor, Robert W., Jr. Aug. 719
Huckle, Frank, Jr., Dec. 1059
December Council Meeting in New York, Jan. 86
Designing Heating and Ventilating Systems, April. 354
DOMESTIC HEATING, UTILIZATION OF ANTHRACITE FOR, Allen J. Johnson, Dec. 1050
Driscoll, W. H., Addresses Eastern Supply Association, April 353
Dunham, C. A., Using Gas-Vapor Mixtures for Heating Purposes, Aug. 689
Eckley, W. A., and F. B. Rowley, Surface Coefficients as Affected by Direction of Wind, Oct. 870
Eighth Annual Convention and Oil Burner Show, April. 354
Eightieth Anniversary, by J. J. Wilson, Jan. 86
Electrical Engineers Elect Officers, Aug. 717
Employment Survey, Nov. 981
Dec. 1060
ENERGY RADIATED FROM METALLIC SURFACES AT HIGH TEMPERATURES, SPECTRAL DISTRIBUTION OF THE, G. R. Greenslade, Jan. 50
Engineering Foundation Reviews Progress for 1930, March. 261
Engle, M. D., Smoke and Dust Abatement, Feb. 146
ESSENTIAL ELEMENTS FOR DETERMINING HEATING PLANT REQUIREMENTS, F. B. Rowley, July. 597
Air Temperatures Required, Heat Utilization, Unit of Measure for Heaters, Calculation of Heat Losses from Buildings, Conclusions.
ESTIMATING FUEL CONSUMPTION, Paul D. Close, May. 433
Infiltration, Heating Efficiencies, Allowance for Non-Heating Periods, Heat Required to Warm Building, Other Factors, Degree-Day Method, Industrial Degree-Day, Rough Approximations.

EXPERIMENTS TO DETERMINE HEATING EFFECT FACTOR, R. N. Trane and C. J. Scanlon, Sept. 783
Discussion of, Sept. 788
Purpose of Investigation, Laboratory Equipment, Procedure, Test Results, Discussion of Results, Conclusions, Addenda, Laboratory Equipment, Procedure, Test Results, Discussion of Results, Conclusions.
Exposition in Cleveland to Present New Equipment, January 25, 1932, Oct. 888
Fahnestock, M. K., and A. P. Kratz, Steam Condensation an Inverse Index of Heating Effect, July 621
Fire Underwriters Issue New Building Code, July 630
Fleisher, W. L., Air Conditioning in the Bakery, Feb. 158
Float-and-Sink Method of Control Being Adopted in Many Alabama Coal Washing Plants, Feb. 178
FLOW OF AIR THROUGH REGISTERS AND GRILLES, MEASUREMENT OF THE, L. E. Davies, April 325
FLOW OF STEAM THROUGH ORIFICES INTO RADIATORS, S. S. Sanford and C. B. Sprenger, June 505
Description of Apparatus and Tests, Results, Application, Conclusions, Acknowledgment, Bibliography.
FRICTION HEADS IN ONE-INCH STANDARD CAST-IRON TEES, F. E. Giesecke and W. H. Badgett, May 430
Apparatus, Calculation of Friction and Velocity Heads, Check of Results, Conclusions.
Frost, R. V., Heating Effect of Radiators, Feb. 168
Study of the Combustible Nature of Solid Fuels, A, Sept. 771
FUEL CONSUMPTION, ESTIMATING, Paul D. Close, May 433
GAS FOR HOUSE HEATING, THE USE OF, H. B. Johns, April 330
GAS-VAPOR MIXTURES FOR HEATING PURPOSES, USING, C. A. Dunham, Aug. 689
Gayhart, E. L., U. S. Naval Requirements for Ship Heating and Ventilation, Oct. 878
Giesecke, F. E., and W. H. Badgett, Friction Heads in One-Inch Standard Cast-Iron Tees, May 430
Government Printing Office Affiliates with A S A, April 329
Grand Rapids Members Meet, Nov. 981
GRAVITY HOT WATER HEATING SYSTEMS, SIZING PIPES AND ORIFICES FOR, E. G. Smith, July 603
Gravity Convectors, Oct. 881
Greenslade, G. R., Spectral Distribution of the Energy Radiated from Metallic Surfaces at High Temperatures, Jan. 50
Grondal, Ben, Utilization of Hot Springs for Heating in Iceland, Feb. 174
Gutberlet, Carl, and F. C. Houghten, Conductivity of Concrete, Sept. 778
Hall, R. E., and A. R. Mumford, Some Fundamental Considerations of Corrosion in Steam and Condensate Lines, Part I, Nov. 943
Part II, Dec. 1041
HEAT AND MOISTURE LOSSES FROM MEN AT WORK AND APPLICATION TO AIR CONDITIONING PROBLEMS.
F. C. Houghten, W. W. Teague, W. E. Miller and W. P. Yant, June 493
Practical Data and Their Application to Air Conditioning Problems, Examples in the Use of Heat and Moisture Loss Data, Heat and Moisture Losses While Dancing, Test Procedure and Observations, Data and Results, Summary.
HEAT EMISSION FROM THE SURFACES OF CAST IRON AND COPPER CYLINDERS HEATED WITH LOW PRESSURE STEAM.
A. C. Willard and A. P. Kratz, Feb. 141
General Statement, Test Plant and Procedure, Test Results, Discussion of Results, Analytical Study, Conclusions.
Heat Transfer Through Metal-Inclosed Insulation, Jan. 64
Heating and Piping Contractors Meeting in Louisville, June. 529
HEATING AND VENTILATING DURING THE PAST QUARTER OF A CENTURY, PROGRESS IN, R. P. Bolton, Jan. 47
Heating and Ventilating Exposition at Cleveland, Second International, July 626
Heating and Ventilating Exposition Expected in Cleveland, Record Breaking, Aug. 716
HEATING AND VENTILATING OF BUILDINS, ACOUSTICAL PROBLEMS IN THE, V. O. Knudsen, Dec. 1035
HEATING AND VENTILATING ON SHIPBOARD, PROBLEMS AND METHODS OF, W. T. Breckenridge, Oct. 875
HEATING EFFECT FACTOR, EXPERIMENTS TO DETERMINE, R. N. Trane and C. J. Scanlon, Sept. 783
HEATING EFFECT OF RADIATORS, R. V. Frost, Feb. 168
Procedure for Making Tests, Analysis of Results, Explanation of Result Obtained, Conclusions.
HEATING PLANT REQUIREMENTS, ESSENTIAL ELEMENTS FOR DETERMINING, F. B. Rowley, July 597
HEATING UNITS AT VARIOUS TEMPERATURES, OUTPUT OF, E. A. Allcut, Nov. 966
Hot Water Code, Tentative, Aug. 697
Houghten, F. C., and Paul McDermott, Wind Velocity Gradients Near a Surface and Their Effect on Film Conductance, March 229
Houghten, F. C., W. W. Teague, W. E. Miller and W. P. Yant, Heat and Moisture Losses from Men at Work and Application to Air Conditioning Problems, June 493
Houghten, F. C., and Carl Gutberlet, Conductivity of Concrete, Sept. 778
House Heating Plants and Smoke Prevention, Aug. 717
IONIC CONTENT OF AIR IN OCCUPIED ROOMS VENTILATED BY NATURAL AND BY MECHANICAL METHODS, CHANGES IN, C. P. Yaglou, L. Claribel Benjamin and Sarah P. Choate, Oct. 865
IMPORTANCE OF RADIATION IN HEAT TRANSFER THROUGH AIR SPACES, E. R. Queer, Nov. 960
Emissivity and Radiation, Effect of Spacing, Effect of Height, Summary, Conclusions, Appendix.
Johns, H. B., The Use of Gas for House Heating. April 330
Knudsen, V. O., Acoustical Problems in the Heating and Ventilating of Buildings, Dec. 1035
Kratz, A. P., and A. C. Willard, Heat Emission from the Surfaces of Cast Iron and Copper Cylinders Heated with Low Pressure Steam, Feb. 141
Kratz, A. P., and M. K. Fahnestock, Steam Condensation an Inverse Index of Heating Effect, July 621
Kubasta, R. W., G. L. Larson and D. W. Nelson, Air Infiltration Through Double-Hung Wood Windows, July 583
Langenberg Heads Engineering Company, July 629
Larson, G. L., and R. F. Norris, Some Studies on the Absorption of Noise in Ventilating Ducts, Jan. 59
Larson, G. L., D. W. Nelson and R. W. Kubasta, Air Infiltration Through Double-Hung Wood Windows, July 583
Making Gas and Coke in a Miniature Plant, Feb. 178
Marks Handbook, April 354
Massachusetts Members Await A. S. H. V. E. at Swampscott, June 22 to 25, May 440
McDermott, Paul, and F. C. Houghten, Wind Velocity Gradients Near a Surface and Their Effect on Film Conductance, March 229
MEASUREMENT OF THE FLOW OF AIR THROUGH REGISTERS AND GRILLES, THE.
L. E. Davies, April 325
Exhaust Grilles, Supply Grilles, Comparison of Anemometers.
Measuring the Temperature of Flames, April 329
Meeting of Committee on Research, Dec. 1060
Meller, H.B.,Air Pollution from the Engineer's Standpoint, Jan. 70
Members to Nominate Candidates for Anderson Medal, Nov. 981
Mid-West Power Conference Fuels Meeting, March 263
Midwest Power Show in Chicago February 10-14, 1931, Feb. 180
Miller, W. E., F. C. Houghten, W. W. Teague and W. P. Yant, Heat and Moisture Losses from Men at Work and Application to Air Conditioning Problems, June 493
Mumford, A. R., and R. E. Hall, Some Fundamental Considerations of Corrosion in Steam and Condensate Lines, Part I, Nov. 943
Part II, Dec. 1041
Nelson, D. W., G. L. Larson and R. W. Kubasta, Air Infiltration Through Double-Hung Wood Windows, July 583
New Edition of A O B A Handbook, July 630
New Era in A. S. H. V. E. Research Begins, A, June 519
New Offices for Richardson & Boynton, Dec. 1060
Nominations for Officers of the Society for 1931, Jan. 81
Nominations for 1932, Oct. 882
Nov. 976
Dec. 1055
Norris, R. F., and G. L. Larson, Some Studies on the Absorption of Noise in Ventilating Ducts, Jan. 59
November Council Meeting in Buffalo, Nov. 981
OIL BURNERS AND LOW-PRESSURE HEATING BOILERS, STUDY OF PERFORMANCE CHARACTERISTICS OF, L. E. Seeley and E. J. Tavanlar, May 419
Oil Burner Show, Feb. 180
OUTPUT OF HEATING UNITS AT VARIOUS TEMPERATURES, E. A. Allcut, Nov. 966
Apparatus and Method of Testing, Form of Enclosure, Steam and Hot Water Tests, Conclusions.
PERFORMANCE CHARACTERISTICS OF OIL BURNERS AND LOW-PRESSURE HEATING BOILERS, STUDY OF, L. E. Seeley and E. J. Tavanlar, May 419
Philadelphia Engineers Discuss Railway Air Conditioning, Dec. 1060
PIPES AND ORIFICES FOR GRAVITY HOT WATER HEATING SYSTEMS, SIZING, E. G. Smith, July 603
Pittsburgh's Plans for 37th Annual Meeting, January 26-29 Complete, Jan. 77
Pneumatic Cleaning Plants for Coal, April 329
PREDETERMINING THE AIRATION OF INDUSTRIAL BUILDINGS, W. C. Randall and E. W. Conover, June 513
Flow Due to Temperature Difference, Flow Due to the Wind, Flow Due to Combined Wind and Temperature Difference, Solution of a Typical Problem, Checks with Field Tests, Summary and Conclusions.
President's Home Building Conference in Washington, Oct. 889
PROBLEMS AND METHODS OF HEATING AND VENTILATING ON SHIPBOARD, W. T. Breckenridge, Oct. 875
Naval Ships, Heating of Naval Vessels, Naval Ventilation, Tests, Merchant Ships.
PROCEEDINGS.
37th Annual Meeting.
Report of
Certified Public Accountant, March 245
Council, March 238
Finance Committee, March 244
1931 Guide Publication Committee, March 243
Secretary, March 239
Tellers of Election, March 241
37th Semi-Annual Meeting, Swampscott, June 22-25, 1931, April 349
Committees, Aug. 713
Program, Aug. 706
Report of Technical Advisory Committee on Radiation, Aug. 711
Technical Advisory Committee, Air Conditions in Relation to Comfort and Health, Aug. 712
Committee on Research, Aug. 711
Resolutions, Aug. 713
PROGRESS IN HEATING AND VENTILATING DURING THE PAST QUARTER OF A CENTURY, R. P. Bolton, Jan. 47
Contribution to Disease Reduction, Reference Books in Use, Typical Problem of 25 Years Ago, Air Conditioning, Gas, Oil and Electricity, Establishment of Research Laboratory.
Progress of Ventilation Standards, Dec. 1060
Proposed Code for Testing Steam Heating Boilers Burning Oil Fuel, April 338
Queer, E. R., Importance of Radiation in Heat Transfer Through Air Spaces, Nov. 960
RADIATORS, HEATING EFFECT OF, R. V. Frost, Feb. 168
Radiators and Convectors, Feb. 173
Randall, W. C., and E. W. Conover, Predetermining the Airation of Industrial Buildings, June 513
RELATION OF STANDARDIZATION TO AIR CONDITIONING IN THE PRINTING INDUSTRY, W. H. Carrier, April 335
Variable Factors, Characteristics Controlled by Air-Conditioning System, Control of Temperature, Control of Humidity, Control of Air Movement, Air Cleanliness, Ventilation, Conclusions.
REPORTS.
A. S. H. V. E. Research Laboratory, Aug. 700
Certified Public Accountant, Mar. 245
Code for Testing and Rating Concealed Gravity Type Radiation, Aug. 695
Committee on Research, Mar., Aug. 249, 711
Council, Mar. 238
Director, Research Laboratory, Mar. 251

Finance Committee, Mar. ... 244
Guide Publication Committee, Mar. ... 243
Secretary, Mar. ... 239
Technical Advisory Committee, Air Conditions in Relation to Comfort and Health, Aug. ... 712
Technical Advisory Committee on Radiation, Aug. ... 711
Tellers of Election, Mar. ... 241
Research Booklet Sent to Society Members, Sept. ... 801
Rowley, F. B., Essential Elements for Determining Heating Plant Requirements, July ... 597
Rowley, F. B., and W. A. Eckley, Surface Coefficients as Affected by Direction of Wind, Oct. ... 870
Salts in Boiler Feed Water Reduce Priming, Dec. ... 1049
Sanford, S. S., and C. B. Sprenger, Flow of Steam Through Orifices into Radiators, June ... 505
Scanlon, C. J., and R. N. Trane, Experiments to Determine Heating Effect Factor, Sept. ... 783
Second International Heating and Ventilating Exposition at Cleveland, July ... 626
Seeley, L. E., and E. J. Tavanlar, Study of Performance Characteristics of Oil Burners and Low-Pressure Heating Boilers, May ... 419
Six Place Tables, April ... 354
Sizing Pipes and Orifices for Gravity Hot Water Heating Systems, E. G. Smith, July ... 603
Definitions, Results of Tests on a Three-Story Experimental Plant, Types of Piping to Which Tables Apply, A Simple Method of Selecting Pipe Sizes for a One-Story Residence, A More Accurate and Economical Method, Branched Line in a Two-Story Residence, Economical Method Applied to a Branch Line, Economical Method Applied to a Branch of Three-Story Installation, Methods Used in Calculating, Questions and Answers, Conclusions.
Smith, E. G., Sizing Pipes and Orifices for Gravity Hot Water Heating Systems, July ... 603
Smoke and Dust Abatement.
M. D. Engle, Feb. ... 146
Smoke, Dust, Noxious Gases, Bibliography.
Society Cooperating with the President on Home Building and Home Ownership, Aug. ... 718
Society Sponsors Paper at Printing Conference, April ... 353
Solid Fuels, A Study of the Combustible Nature of, R. V. Frost, Sept. ... 771
Some Fundamental Considerations of Corrosion in Steam and Condensate Lines, Part I, R. E. Hall and A. R. Mumford, Nov. ... 943
Solvent Action of Water in the Steam Heating Cycle, Gases of the Atmosphere: Law of Henry and Dalton, Results of Simultaneous Solvent Action of Water with Atmospheric Gases on Metals, Analysis of Conditions in the Steam Generating, Distributing and Utilizing Systems, Problems of the Distributing System, The Quantity Factor —Dissolved Oxygen, Discussion of Data from Various Buildings.
Part II, Dec. ... 1041
Problems of Utilization Division, Analyses for Oxygen and Carbon Dioxide at Various Points in Two Buildings, Summary and Conclusions.
Some Studies on the Absorption of Noise in Ventilating Ducts, G. L. Larson and R. F. Norris, Jan. ... 59
Acoustical Discussion, Object of Tests, Description of Test Apparatus, Method of Procedure, Discussion of Results, Conclusions.
Spectral Distribution of the Energy Radiated from Metallic Surfaces at High Temperatures, G. R. Greenslade, Jan. ... 50
Apparatus, The Standard Lamp, Protection of the Metal Specimens, General Precautions, Temperature Measurements, Summary and Conclusion, Acknowledgments.
Sprenger, C. B., and S. S. Sanford, Flow of Steam Through Orifices into Radiators, June ... 505
Standards for Pipe Flanges and Fittings, June ... 531
Standards of Hydraulic Society Issued, July ... 630
Steam Condensation an Inverse Index of Heating Effect, A. P. Kratz and M. K. Fahnestock, July ... 621
Description of Apparatus, Test Procedure, Results of Tests, Conclusions.
Study of Performance Characteristics of Oil Burners and Low-Pressure Heating Boilers, L. E. Seeley and E. J. Tavanlar, May ... 419
Apparatus Used in the Study, Test Set-Up and Procedure, Types of Tests Run and Leading Results, Summary.
Study of the Combustible Nature of Solid Fuels, A, R. V. Frost, Sept. ... 771
Blending of Coals, Horizontal Ignition, Conclusions.
Surface Coefficients as Affected by Direction of Wind, F. B. Rowley and W. A. Eckley, Oct. ... 870
Apparatus and Test Procedure, Results of Tests, Summary and Conclusions, References.
Survey of the Society's Research Interests, Sept. ... 797
Survey Report on Simplification of Steel Heating Boilers Discussed by Simplification Committee of Industry, March. 268
Tavanlar, E. J., Study of Performance Characteristics of Oil Burners and Low-Pressure Heating Boilers, May ... 419
Teague, W. W., F. C. Houghten, W. E. Miller and W. P. Yant, Heat and Moisture Losses from Men at Work and Application to Air Conditioning Problems, June ... 493
Tentative Hot Water Code, Aug. ... 697
Thornton to Manage Westinghouse Association Activities, July ... 630
Trane, R. N., and C. J. Scanlon, Experiments to Determine Heating Effect Factor, Sept. ... 783
Tribute to A. S. H. V. E. Research, Sept. ... 782
U. S. Naval Requirements for Ship Heating and Ventilation, E. L. Gayhart, Oct. ... 878
Introduction of Combined Heating and Ventilating System. Description of Ventilation System, Description of Heating System, Heating and Ventilating Requirements, Insulation.
Universal Atlas Handbook of Concrete Construction, June ... 531
Use of Gas for House Heating, The, H. B. Johns, April ... 330
Distribution of Gas, Selecting the Equipment, Estimating the Cost of Heating with Gas, Installation of Equipment, Chimney Construction Is Important, Caring for the Installation, Other Types of Equipment, Unit Heaters.
Using Gas-Vapor Mixtures for Heating Purposes, C. A. Dunham, Aug. ... 689
Description of Apparatus, Test Procedure, Data and Calculations, Results, Durability, Summary and Conclusions.
Utilization of Anthracite for Domestic Heating, Allen J. Johnson, Dec. ... 1050
Utilization of Hot Springs for Heating in Iceland, Ben Grondal, Feb. ... 174
Investigation Authorized. Wells Drilled, Other Hot Areas, Heat Supply from the Wash Spring.
Warm Air Heating Association Meeting, April ... 353
Willard, A. C., and A. P. Kratz, Heat Emission from the Surfaces of Cast Iron and Copper Cylinders Heated with Low Pressure Steam, Feb. ... 141
Wilson, J. J., Eightieth Anniversary, Jan. ... 86
Wind Velocity Gradients Near a Surface and Their Effect on Film Conductance, F. C. Houghten and Paul McDermott, March ... 229
Determination of Film Conductance Coefficients, Determination of Wind Velocity Gradients, Summary and Conclusions.
Yaglou, C. P., L. Claribel Benjamin and Sarah P. Choate, Changes in Ionic Content of Air in Occupied Rooms Ventilated by Natural and by Mechanical Methods, Oct. ... 865
Yale Institute of Human Relations Dedicated, June ... 531
Yant, W. P., F. C. Houghten, W. W. Teague and W. E. Miller, Heat and Moisture Losses from Men at Work and Application to Air Conditioning Problems, June ... 493